

Sun Tanning Behaviors, Health Beliefs, Attitudes and Intentions among College Students

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Abstract

Purpose: Even though it is well known that sun tanning can cause cancer, the behavior is practiced by a significant proportion of the US population, with about 50% of white adolescents and adults engaging in the behavior. This study assessed the sun tanning behaviors and sun tanning health beliefs, attitudes, and intentions among college students at a university in a beach resort town. **Methods:** Students (n=632) were recruited by email and participated in an electronic survey. All students at the university were invited to participate. **Results:** Females and those who had higher perceived benefits of tanning, and those who had friends who sun tanned spent more time intentionally sun tanning. Also, an association existed between having a positive attitude toward tan skin and using tanning beds (OR=2.51). Those with intentions to decrease sun tanning were more often female, had higher perceived severity of tanning, and higher self-efficacy of avoiding tanning (OR=2.30). **Conclusions:** Females may be a prime target population for preventive interventions since they sun tan more often, but also have higher intentions to avoid the behavior. Additionally, the results of this study seem to indicate that females' behaviors are more predictable according to the Health Belief Model (HBM). Because of this, interventions that seek to address HBM constructs might be more effective for females compared to males.

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Introduction

Sun tanning, the behavior of purposely laying in the sun or in a tanning bed, is a prevalent behavior. These practices can result in various forms of skin cancer, including the most serious form, melanoma (American Cancer Society, [ACS]). In the United States the prevalence of skin cancer has increased over the past 30 years, largely as a result of intentional sun tanning behavior (Centers for Disease Control [CDC], 2012), and each year it is estimated that one million people in the US will be diagnosed with skin cancer (National Cancer Institute [NCI], 2010). According to the American Cancer Society, each year more than 76,000 people will develop melanoma (ACS, 2013) as a result of sun tanning or tanning bed use. In fact, those people who use tanning beds have about a 74% increased chance of developing melanoma (Lazovich, 2010).

Even though it is well known that sun tanning can cause cancer, the behavior is practiced by a significant proportion of adolescents and adults, especially among Caucasians (NCI, 2010). Adolescents and young adult females are most likely to sun tan and are also the least likely to use sunscreen, making them susceptible to skin cancer (Heckman, Wilson, Ingersoll, 2009; Stanton, Janda, Baade, & Anderson, 2009). Additionally, studies have found that less than 40% of high school students in the U.S. used sunscreen and 69% reported being sunburned in the past year (Buller, Cokkinides, & Hall, 2011; Cokkinides, Weinstock, & Glanz, 2006). A majority of white adolescents and young adults believe that they look more attractive and healthier with a tan (Cokkinides, et al., 2006). It has also been suggested that the reward of tanning (i.e. attractiveness) outweighs any cost that may be a result of lying in the sun or in a tanning bed (i.e., cancer) (Lucci, Citro, & Wilson, 2012; Spradlin, Bass, & Hyman, 2010; Coups, Manne, & Heckman, 2008).

The goal of this study was to investigate the explanatory value of tanning health beliefs such as attractiveness and attitudes on sun tanning behavior. This study is also unique in that the interactive effects of gender and health beliefs were assessed to determine whether the relationship between beliefs and attitudes with sun tanning-related behaviors varied by gender. Additionally, the population studied is unique in that 41% of the students indicated that they chose the university based on being close to the beach and 55% of the students were from out of state. Research on tanning behaviors and beliefs of college students have typically focused on a homogeneous population of college students, whereas this study's population is diverse and a large percentage of students chose the university based on location. As such, the tanning health beliefs and attitudes of students in the current study may differ compared to the general population of college students.

Methods

Participants

Participants consisted of 824 undergraduate students at one university in a southeast beach resort town. The sample consisted mostly of white students (79.9%) followed by black students (18.2%). As a result of the majority of the sample being white, all other races and ethnic groups were excluded from the analysis. This exclusion resulted in a sample size of 632 white undergraduate students. The reduced sample consisted of 23.9% freshmen, 22.7% sophomores, 25.7% juniors, and 27.7% seniors. The majority of the sample was female (73.9%) and the mean age of students was 21.1 (SD=3.24) years.

Procedures

An electronic survey was administered to college students during March of 2013. All undergraduate students at the University (n=9,200) were sent an introductory email explaining the study and asking them to complete a 30-minute survey. Students were assured that the survey was completely anonymous and that there were no anticipated discomforts or risks associated with participating in the study. A small incentive was provided to 25 randomly selected students for their

participation. The Institutional Review Board of the author's University approved the study before any data was collected. Participants gave implied consent by choosing to participate in the study.

Measures

The survey consisted of questions with demonstrated reliability and validity (Reid & Aiken, 2013; Walsh & Stock, 2012; Branstrom, Ullen, & Brandberg, 2004; Grunfeld, 2004). The first section of the survey assessed demographics, and asked the respondents to describe their gender, age, year in school, race, in state/out of state residency, and reason for selection of the university. The second section assessed sun tanning behaviors and asked students to describe such behaviors as the amount of time spent sun tanning on a typical day, friends' amount of time spent sun tanning on a typical day, and amount of sun burns in the past 12 months. The third section assessed intentions to protect against ultraviolet radiation, decrease sun exposure, and intention to wear sunscreen. The fourth section assessed sun tanning attitudes and participants indicated the degree that they agreed or disagreed to a series of three statements (e.g., "Having tan skin is important to me)." The scores on the three items were calculated to produce an attitude towards sun tanning scale. Cronbach's alpha for the summed scale was 0.77. The fifth section assessed the benefits of sun exposure. Participants indicated their level of agreement or disagreement to a series of three statements about the benefits of sun exposure (e.g., "I look attractive with a tan)." The scores on the items were calculated to produce a perceived benefit scale. Cronbach's alpha for the summed scale was 0.90. The sixth section assessed barriers of sun exposure with participants indicating their level of agreement with to a series of three statements about sun exposure (e.g., "Living close to the beach makes it difficult to avoid sun tanning)." The scores on the items were calculated to produce a perceived barrier to sun tanning scale, with a Cronbach's alpha of 0.82. The seventh section assessed perceived severity of sun tanning with participants indicating their level of agreement or disagreement to a series of three statements (e.g., "Sun tanning can result in

premature aging).” The scores on the items were calculated to produce a perceived severity scale. Cronbach’s alpha for the summed scale was 0.70. The eighth section assessed susceptibility with participants indicating the level of agreement to a series of four statements (e.g., “Over exposure to the sun can result in skin cancer).” The scores on the items were calculated to produce a perceived susceptibility scale. The Cronbach’s alpha for the summed scale was 0.82. The last section of survey assessed the self-efficacy, with participants indicating their level of agreement or disagreement to a series of three statements on sun protection (e.g., “I feel confident that I can avoid sun tanning).” The scores on the items were calculated to produce a self-efficacy scale, with a Cronbach’s alpha of .70 for the summed scale.

Statistical Analysis

First, frequencies were calculated for all variables of interest. Next, logistic regression was used to determine the relationship between the independent variables on sun-related behaviors. Eight separate regression analysis were conducted, one for each dependent variable. The dependent variable in each separate analysis were the following: 1) amount of time spent sun tanning (this variable was dichotomized into the categories – those spending more than two hours in the sun vs. those spending less than two hours in the sun; 2) amount of time friends spent sun tanning (this variable was dichotomized into the categories – those whose friends spent more than two hours in the sun vs. those whose friends spent less than 2 hours in the sun; 3) use of tanning beds; 4) ever had a painful sunburn in the past year; 5) amount of sunburns in the past year (this variable was dichotomized into the categories – zero to two and three or more sun burns in the past year; 6) intent to decrease sun exposure; 7) intent to wear sunscreen; 8) intent to use recommended SPF. The independent variables used in each of the eight regression analysis included gender, class rank, reason for attending the university, place of residency, skin type, attitude, perceived severity, perceived susceptibility, perceived benefits, perceived barriers, and self-efficacy. For those health

belief predictor variables that were significant in the previous analyses, a health belief x gender interaction term was included into the logistic regression model to determine whether the relationship between the given health belief variable and the given outcome varied by gender.

Results

Table 1 compares males and females on the variables of interest in this study. Females are significantly more likely than males to spend more than two hours in the sun tanning, have friends that spend more than two hours in the sun tanning, use tanning beds, and have intentions to decrease sun tanning. Additionally, it was found that females are significantly more likely than males to hold positive beliefs of the benefits of tanning and have a positive attitude towards tanning. Lastly, it was found that females, more than males, perceived the severity of the tanning (i.e., premature aging) and susceptibility of tanning (i.e., cancer).

Sun Tanning Behavior

The results of the regression analysis for different behaviors related to sun exposure are found in Table 2. Females were significantly more likely than males to indicate that they spent more than two hours in the sun tanning (AOR= 3.11, CI=1.91-5.08). Individuals who selected the university based on being close to the beach were 1.54 (CI=1.00-2.37) times more likely to report spending more than two hours tanning, as were those students who were from out of state (AOR=1.49, CI=1.01-2.21). Perceived benefits of tanning (AOR=1.36, CI=0.22-0.65) was a strong predictor of spending more than two hours in the sun tanning, with 70.4% of females and 50.9% of males believing they looked more attractive with a tan. In the second regression model with gender X perceived benefits it was found that the relationship between perceived benefits of tanning and spending more than two hours in the sun tanning was stronger for females compared to males AOR= 2.59, (CI = 1.68-3.99). This relationship was also found for self-efficacy of avoiding tanning (AOR=4.74, CI=3.42-6.58), even though females reported spending more time in the sun tanning.

Table 1**Sun Tanning Behaviors, Health Beliefs, Attitudes, and Intentions of College Students, by Gender**

Variable	Female		Male		p
	n	%	n	%	
More than 2 hours in the Sun Tanning	200	42.9	29	17.6	.000
Friends Spend more than 2 Hours in the Sun Tanning	275	60.3	52	39.9	.000
Use Tanning Beds	164	35.2	12	7.3	.000
Sunburn in Past 12 Months	340	73	121	73.3	.507
Three or More Sunburns in Past 12 Months	52	15.3	19	15.7	.514
Intend to Decrease Sun Exposure	188	40.3	54	32.7	.050
Intend to Wear Sunscreen	363	77.9	118	71.5	.062
Intend to Use of Recommended SPF	278	76.6	94	79.7	.288
Perceived Benefit (I look attractive with a tan)	326	20.4	84	50.9	.000
Perceived Barrier (Using sunscreen is too much trouble)	35	7.5	19	11.5	.083
Perceived Severity (Sun tanning result in premature aging)	418	90.7	137	83.5	.011
Perceived Susceptibility (Skin cancer)	359	77.0	115	69.7	.040
Self-Efficacy (Avoid sun tanning)	107	25.5	42	21.5	.301
Attitude (Having tan skin is important to me)	258	55.6	90	50.0	.004

Friends' Sun Tanning Behavior

Over 60% of females indicated that their friends spent more than two hours in the sun tanning compared to 31.9% of males (AOR= 2.84, CI=1.89-4.27). Perceived benefits of tanning (AOR=1.46, CI=0.26-0.80) was also a predictor of having friends that spent more than two hours in the sun tanning. In the second regression model with gender X perceived benefits it was found that the relationship between perceived benefits of tanning and having friends that spent more than two hours in the sun tanning was stronger among females compared to males (AOR=1.49, CI=1.18-1.88).

Tanning Bed Use

Over 35% of females reported using a tanning bed compared to only 7.3% of males (AOR= 6.60, CI=3.43-12.7). It was also found that those individuals who selected the university based on being close to the beach were 2.35 (CI=1.49-3.72) times more likely to report using a tanning bed. Additionally, it was found that those students who skin always tans and never burns (AOR=2.52, CI=1.45-4.39) were significantly more likely to use a tanning bed. There was also

a relationship between having a positive attitude toward having tan skin and using a tanning bed (AOR=2.51, CI=1.39-4.53). When assessing the interactive effect of gender and attitude, it was found that the relationship between attitude and tanning bed use was stronger among females compared to males (AOR=1.30, CI=1.03-1.64).

Intentions to Decrease Sun Exposure

The results of the regression analysis for different behaviors related to sun protection are found in Table 3. Over 40% of females reported intentions to decrease sun tanning compared to 32.7% of males (AOR= 1.97, CI=1.26-3.06). It was also found that those individuals who perceived that sun tanning could result in premature aging (perceived severity) were 2.62 (CI=1.27-5.41) times more likely to intend to decrease their sun tanning behaviors. Also, there was a relationship between self-efficacy and intent to decrease sun tanning (AOR=2.30, CI=1.49-3.54). The interactive effect of gender and perceived severity of tanning was not significantly associated with intentions to decrease sun exposure.

Table 2

Odds Ratios for Sun Exposure Variables					
Variable	AOR for 2+ hours in the sun tanning	AOR for friends spending 2+ hours in the sun tanning	AOR for using a tanning bed	AOR for painful sunburn in the past year	AOR for 3+ sunburns in the past year
Gender					
Men					
Women	3.11 (1.91-5.08)	2.84 (1.89-4.27)	6.60 (3.43-12.7)	0.94 (0.60-1.46)	0.81(0.43-1.53)
Class					
Freshmen					
Sophomore	1.06 (0.60-1.88)	1.12 (0.66-1.90)	1.09 (0.58-2.03)	0.83 (0.46-1.50)	0.83 (0.37-1.85)
Junior	1.41 (0.81-2.45)	1.75 (1.04-2.95)	1.32 (0.72-1.43)	1.34 (0.77-2.46)	1.13 (0.51-2.50)
Senior	0.99 (0.57-1.73)	1.20 (0.72-2.01)	2.01 (1.11-3.66)	1.07 (0.61-1.87)	0.58 (0.25-1.34)
Reason for attending					
Other					
Beach	1.54 (1.00-2.37)	1.31 (0.86-2.00)	2.35 (1.49-3.72)	0.64 (0.40-1.03)	1.37 (0.75-2.50)
Residency					
In state					
Out of state	1.49 (1.01-2.21)	0.96 (0.67-1.38)	1.03 (0.67-1.58)	0.76 (0.51-1.12)	1.79 (0.97-3.30)
Skin Type					
burns/never tans					
Tans/ never burns	2.19 (1.35-3.56)	1.43 (0.94-2.16)	2.52 (1.45-4.39)	4.16 (2.39-7.25)	0.34 (0.19-0.63)
Perceived Benefits (i.e., I look attractive with a tan)	1.36 (1.22-1.65)	1.46 (1.26-1.80)	0.95 (0.47-1.88)	0.86 (0.47-1.55)	0.27 (0.11-0.64)
Perceived Barriers (i.e., using sunscreen is too much trouble)	0.84 (0.43-1.64)	0.93 (0.49-1.77)	0.87 (0.42-1.82)	1.42 (0.73-2.75)	1.46 (0.59-3.58)
Perceived Severity (i.e., sun tanning can result in premature aging)	1.05 (0.58-1.92)	1.78 (0.80-3.18)	1.28 (0.65-2.50)	1.60 (0.85-3.02)	1.38 (0.53-3.61)
Perceived Susceptibility (i.e., cancer)	0.87 (0.56-1.36)	0.91 (0.60-1.39)	0.72 (0.45-1.17)	0.75 (0.48-1.17)	0.89 (0.47-1.70)
Self-Efficacy (i.e., avoid sun tanning)	1.38 (1.22-1.63)	0.71 (0.46-1.08)	0.92 (0.55-1.53)	1.54 (0.98-2.41)	1.18 (0.60-2.31)
Attitude (i.e., having tan skin is important to me)	1.21 (0.72-2.01)	0.86 (0.52-1.44)	2.51 (1.39-4.53)	0.87 (0.50-1.49)	0.69 (0.33-1.43)
Perceived Benefit X Gender+	2.59 (1.68-3.99)	1.49 (1.18-1.88)			
Self-Efficacy X Gender+	4.74 (3.42-6.58)				
Attitude X Gender+ +reference group = male			1.30 (1.03-1.64)		

Table 3

Variable	Odds Ratios for Sun Protection Variables		
	AOR for intent to decrease sun exposure	AOR for intent to wear sunscreen	AOR for intent to use recommended SPF
Gender			
Men			
Women	1.97 (1.26-3.06)	0.67 (0.42-1.06)	0.87 (0.49-1.56)
Class			
Freshmen			
Sophomore	0.69 (0.39-1.21)	1.76 (0.96-3.22)	1.06 (0.50-2.24)
Junior	0.93 (0.54-1.61)	1.33 (0.72-2.46)	0.63 (0.31-1.27)
Senior	1.01 (0.59-1.73)	1.15 (0.62-2.12)	0.61 (0.31-1.22)
Reason for attending			
Other			
Beach	0.88 (0.56-1.39)	1.05 (0.65-1.70)	0.77 (0.45-1.34)
Residency			
In state			
Out of state	0.77 (0.53-1.14)	0.64 (0.42-0.99)	0.68 (0.40-1.13)
Skin Type			
Burns/never tans			
Tans/never burns	0.57 (0.37-1.87)	1.00 (0.82-3.01)	0.27 (0.13-0.54)
Perceived Benefits (i.e., I look attractive with a tan)	1.17 (0.81-5.58)	0.61 (0.32-1.17)	0.93 (0.42-2.07)
Perceived Barriers (i.e., using sunscreen is too much trouble)	0.63 (0.30-1.32)	1.57 (0.41-1.65)	0.63 (0.21-1.87)
Perceived Severity (i.e., sun tanning can result in premature aging)	2.62 (1.27-5.41)	1.48 (1.27-1.86)	1.41 (0.64-3.10)
Perceived Susceptibility (i.e., cancer)	1.03 (0.66-1.60)	0.67 (0.42-1.06)	1.57 (0.90-2.74)
Self-Efficacy (i.e., avoid sun tanning)	2.30 (1.49-3.54)	0.52 (0.29-0.93)	1.75 (0.93-3.28)
Attitude (i.e, having tan skin is important to me)	0.77 (0.45-1.32)	1.01 (0.57-1.79)	0.47 (0.23-0.97)
Perceived Severity X Gender + reference group = male		1.02 (0.97-1.20)	0.97 (0.70-1.39)

Intentions to Wear Sunscreen

Over 77% of females reported intentions to wear sunscreen compared to 71.5% of males. Those individuals who perceived that sun tanning could result in premature aging (perceived severity) were 1.48 (CI=1.27-1.86) times more likely to intend to wear sunscreen. When assessing the interactive effect of gender and perceived severity of tanning was not significantly associated with intentions to wear sunscreen.

Discussion

The purpose of this study was to assess the sun tanning behaviors of college students and to ascertain the health beliefs, attitudes, and

intentions that may influence the behavior. The study focused on a sample of college students at one university in a beach resort town in the southeast.

The results of the study indicate that tanning behavior was prevalent with approximately 43% of females spending more than two hours in the sun tanning on a normal day and about 18% of males. These results are similar to other studies that found females are more likely to participate in sun tanning behaviors both indoors and outdoors than males (Kasparian, McLoone, Meiser, 2009; Poorsattar, Hornung, 2007).

Factors that were associated with sun tanning for periods of two or more hours consisted of being

female, choosing the university based on being close to the beach, being an out of state student, having skin that always tans and never burns, and perceived benefits of having a tan. This seems to suggest that multiple contributing factors are influencing tanning practices including environmental (proximity to the beach), personal (female, skin type), and perceived benefit of tanning (i.e., belief of the attractiveness of tan skin). This result regarding perceived benefits is similar to other studies in which it has been found that people are more likely to sun tan if they perceive that tanning enhances their appearance, attractiveness, sex appeal, etc. (Grunfeld, 2004; Cafri, Thompson, Jacobsen, Hillhouse, 2009). Research has found that females are more likely to hold this belief (Lucci, Citro, & Wilson, 2012; Spradlin, Bass, & Hyman, 2010) which was also observed in this study.

No study to date has assessed college students selecting their university based on being close to the beach as a factor for sun tanning. Over 41% of students report that they chose the university based on being near the beach. This may be a result of preference for the coast which in turn may influence one's decision to tan. One study found that vacationing to sunny locations was associated with intentional tanning among adults (Branstrom, 2004).

Factors associated with friends spending more than two hours in the sun tanning consisted of being female and perceived benefits of tanning. This result seems to suggest that normative influences of friends contributes to perceived benefits of college students regarding sun tanning for more than two hours. According to the Theory of Planned Behavior, social norms are a strong predictor of one's behaviors (Ajzen, 1991). Geller, Colditz, Oliveria, et al. (2002) for example found that the number of friends who sun tanned was directly related to sun tanning in a sample of adolescents.

Factors that were associated with tanning bed use were being female, choosing the university based on being close to the beach, having skin that always tans and never burns, and having a positive attitude toward tan skin. Research

typically finds that females are more likely to use tanning bed compared to males. Neenan, Lea, Lesesky, (2012) found that in a sample of community college students, 79% of females were current or former tanning bed users compared to only 21% of males. Additionally, research typically finds a strong correlation between a positive attitude towards having tan skin and engaging in tanning bed use (Branstrom, et al., 2004; Yoo, Kim, 2012; Banerjee, Greene, Bagdasarov, Campo, 2009).

It was found that an association existed between intention to decrease sun tanning behavior and being a female, having the belief of perceived severity of the damaging effect of sun tanning, and self-efficacy of avoiding sun tanning behaviors. This seems to indicate that those students who perceived that the sun could cause such thing as premature aging and felt confident in their ability to refrain from tanning were more likely to intend to reduce their tanning practices. It was also found that those students who had perceived severity of the damaging effect of sun tanning were more likely to wear sun protection with more females than males holding this belief.

Limitations

The results of this study must be considered in light of several limitations. First, the study was cross-sectional at one university. Thus, the generalization of the results must be done so with caution. Second, this study was self-reported behaviors and beliefs of sun tanning practices. There is no way to ensure the accuracy of the responses. However, steps were taken to ensure the reliability of the study by assuring the students that the survey was completely anonymous and by requesting honest responses.

Implications

The results of this study found varying patterns of behavior based on demographic factors (i.e., gender, reason for selecting the university), various health beliefs regarding sun tanning, and attitudes toward sun tanning. These findings can be used to develop sun protection interventions. Interventions to decrease sun exposure should focus on the beliefs many college students have

regarding the attractiveness of tan skin and the perceived importance of tan skin. Additionally, there needs to be a focus on changing students' perception of the risks associated with sun tanning. This study found a high percentage of students were engaging in intentional sun tanning and most of those students did not feel susceptible to skin cancer. As such, preventive interventions should focus on the health beliefs and attitudes many college students hold regarding sun tanning, and there is a need to focus on gender differences regarding attitudes, beliefs and behaviors regarding sun tanning and sun protection.

The results of this study seem to indicate that females' sun tanning behavior and sun protection behavior is more predictable according to the Health Belief Model (HBM). For example, there was a stronger relationship

between perceived benefits of tanning and engaging in sun tanning and friends' sun tanning among females compared to males. This relationship was also found for self-efficacy of avoiding sun tanning. Because of this, interventions that seek to address HBM constructs might be more effective for females compared to males. Because males did not seem to be influenced as much by the constructs of the HBM, unique strategies may be needed to influence their behavior. One approach might be to use female friends to influence men's behavior change. It is also important to consider such factors as location and gender. Forty-one percent of the students indicated that they chose the university based on being close to the beach and 55% of the students were from out of state. These students may be less aware of the harmful effects of the sun or have different beliefs and females may hold different beliefs than males.

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